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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/505,803	02/17/2000	James E Arnold	RA6-021400	7268

7590 02/10/2005  
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EXAMINER

COMPTON, ERIC B

ART UNIT PAPER NUMBER

3726

DATE MAILED: 02/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/505,803

**Applicant(s)**

ARNOLD, JAMES E

**Examiner**

Eric B. Compton

**Art Unit**

3726

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 17-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Remarks***

1. On February 1, 2005, Technology Center 3700 ordered a Withdrawal of Notice of Allowance for this application, and instructed the Examiner to make the following rejections as detailed below.
2. The Examiner relied on set of claims provided as an Appendix to the Appeal Brief filed September 22, 2003.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 17-23, and 25-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of US Patent 4,554,130 to Ecer.

AAPA, as found on pages 1-16 of the specification, disclose various methods of forming (and or repairing) metal products, including the cutting edge of cutting tools, comprising, the following steps: forming a substrate blank to near-finished dimensions, performing pre-coating treatments, coating the substrate with a protective coating, and performing post-coating treatment. Furthermore, it is disclosed that, "Turbine engine airfoil parts, such as vanes, are

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manufactured to precise tolerances that determine airflow characteristics for the part" (page 16, lines 4-5). Therefore, it is inherent that the dimensional changes, i.e., pre-processed dimensions versus post-processed dimensions, of the part, due to coatings or treatments must be selected precisely and monitored such that the final parts retains precise tolerances. Since, the present invention is concerned with forming a metal product, rather than repairing or restoring a damaged metal product, the dimensions can be selected up-front.

With regards to coating the metal substrate, "The coating material layer is formed to build-up the metal component to desired finished dimensions and to provide the finished product with various surface attributes" (page 4, lines 11-12). Prior to coating, it is also known to provide a hot isostatic pressing (HIP) treatment to consolidate the metal powder of the casting (see pages 8-9). A protective coating is then applied, using a high-density coating process, for example a Hyper Velocity Oxyfuel (HVOF) plasma thermal spray process (see pages 6-7). Once coated, the metal part may be subjected to another hot isostatic pressing (HIP) treatment in order to eliminate porosity of the coating and optimize the polycrystalline microstructure (pages 13-15). In a case in which a substrate is coated with a metallic overlay and a high temperature corrosion resistant outer layer, the subsequent HIP treatment was performed to "eliminate porosity and creates an inter-diffusion between the outer layer, the overlay and the substrate" (page 15, lines 6-10). Therefore, as recognized by Applicant, it is known to performed a HIP treatment in order to diffusion bond the coating material to the workpiece substrates.

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However, AAPA does not specifically disclose that the edge is capable of being sharpened after the step of coating a metal substrate.

Ecer discloses a method for forming a cutting edge (223a) with a hard wear resistant coating (225) of a drilling bit tool (227). See Figures 10-12. The reference discloses:

The basic method of consolidating metallic body means in accordance with the invention includes the steps:

(a) applying to the body means a mixture of

- (i) metallic powder
- (ii) fugitive organic binder
- (iii) volatile solvent

(b) drying the mixtures, and

(c) burning out the binder and solvent at elevated temperature,

(d) and applying pressure to the powdered metal to consolidate same on the body means.

The third mixture may be applied to the body means by dipping, painting or spraying ...

Col. 2, lines 11-25.

Ecer further discloses that step (d) is a hot isostatic process. See e.g., col. 4, lines 46-50 (Step No. 12 of the generally inventive concept). "Powdered metal cladding 225 (consolidated as per the above described method) is formed on the sleeve member 223, i.e. at the sleeve exterior, to define wear resistant local outer surfaces, which are spaced apart at 227 and spiral about central axis 228 and along the sleeve length, thereby to define well fluid circulation passages in spaces 227." Col. 10, lines 55-61. In an alternative embodiment, the reference discusses the coating has a self-sharpening effect as they wear. See Col. 8-9, line 2-8. Thus, the coating may be inherently subject to sharpening in the down-hole condition for which the coating is retaining.

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Regarding claims 17, 27, and 32, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have performed a edge grinding step after the coating step of AAPA, in light of the teachings of Ecer, in order to form a product having a well defined edge portion.

Further regarding claim 27, AAPA and Ecer do not specifically disclose forming a metal product comprising a kitchen knife. However, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have formed this article using the process disclosed by AAPA/Ecer, since all kitchen knife surfaces are subject to wear and would benefit from having a wear resistant coating.

Regarding claims 18, 28, and 33, AAPA discloses that a protective coating is then applied, using a high-density coating process, for example a Hyper Velocity Oxyfuel (HVOF) plasma thermal spray process (see pages 6-7).

Regarding claims 19, 29, and 34, The HIP treatment claimed by Applicant is essentially the same HIP treatment disclosed by AAPA. "HIP treatment is used in the densification of cast metal components and as a diffusion bonding technique for consolidating powder metals. In the HIP treatment process, a part to be treated is raised to a high temperature and isostatic pressure. Typically, the part is heated to 0.6 - 0.8 [60 - 80%] times the melting point of the material comprising the part, and subjected to pressures on the order of 0.2 to 0.5 [20 - 50%] times yield strength of the material. Pressurization is achieved by pumping an inert gas, such as Argon, into a pressure vessel. Within the pressure vessel is a high temperature furnace, which heats the gas to the desired temperature. The

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temperature and pressure are held for a set length of time, and then the gas is cooled and vented" (see pages 8-9, lines 17-6).

Regarding claims 20, 30, and 35, while AAPA and Eer does not specifically note that the sintering process removes trapped gas, by providing a densification step (e.g., sintering) the porosity is nearly eliminated and therefore, any trapped gas that may have been in the void formed by the pores of the material would also be eliminated.

Regarding claim 21, AAPA discloses that the substrate can be a high-speed steel cutting tool surface (page 5, line 1). Ecer also discloses the substrate can be a tools steel having large amounts of strong carbide formers. (col. 6, lines 23-26).

Regarding claim 22, 31, and 36, AAPA notes the use of coating such as Carbide, Cobalt, and TiN on cutting tools (page, 5, line 10). Ecer also discusses the use of the coating having cobalt or nickel. (col. 6, lines 45-49).

Regarding claim 23, AAPA notes the coating vanes which are made of a nickel or cobalt-based alloy (page 3, lines 3-4) of the step of coating parts including vanes using HVOF or Detonation Gun coating techniques (page 7, line 12).

Regarding claim 25, AAPA notes providing a coating to a cutting tool, such as a drill bit (page 4, lines 18). Likewise, Ecer teaches coating a cutting tool (see fig. 1).

Regarding claim 26, AAPA and Ecer do not specifically disclose forming a metal product comprising one of an ice skate blade, snow ski edge, kitchen knife,

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pen tip, and finishing hook. However, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have formed any of these article using the process disclosed by AAPA/Ecer, since all of these surfaces are subject to wear and would benefit from having a wear resistant coating.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Compton whose telephone number is (571) 272-4527. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (571) 272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Eric B. Compton  
Primary Examiner



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